

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 03 FEB 2006

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Applicant's or agent's file reference WO 37658	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP2003/011851	International filing date ( <i>day/month/year</i> ) 24.10.2003	Priority date ( <i>day/month/year</i> ) 24.10.2003
International Patent Classification (IPC) or both national classification and IPC F01D9/02		
Applicant HONEYWELL INTERNATIONAL INC		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
  
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
 

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:
 

I ☒ Basis of the opinion

II ☐ Priority

III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

IV ☐ Lack of unity of invention

V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

VI ☐ Certain documents cited

VII ☐ Certain defects in the international application

VIII ☐ Certain observations on the international application

Date of submission of the demand  07.03.2005	Date of completion of this report  06.02.2006
Name and mailing address of the International preliminary examining authority:  <div style="display: flex; align-items: center;"> <div>                         European Patent Office - P.B. 5818 Patentlaan 2                          NL-2280 HV Rijswijk - Pays Bas                          Tel. +31 70 340 - 2040 Tx: 31 651 epo nl                          Fax: +31 70 340 - 3016                     </div> </div>	Authorized Officer  O'Shea, G  Telephone No. +31 70 340-4424



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/EP2003/011851**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-10 as originally filed

**Claims, Numbers**

2-18 as amended (together with any statement) under Art. 19 PCT  
1 received on 22.12.2005 with letter of 22.12.2005

**Drawings, Sheets**

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
  - ☐ the language of publication of the international application (under Rule 48.3(b)).
  - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
  - ☐ filed together with the international application in computer readable form.
  - ☐ furnished subsequently to this Authority in written form.
  - ☐ furnished subsequently to this Authority in computer readable form.
  - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:
- ☐ the description, pages:
  - ☐ the claims, Nos.:
  - ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/EP2003/011851**

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-18
	No: Claims	
Inventive step (IS)	Yes: Claims	1-18
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: JP 55 037508 A (ISHIKAWAJIMA HARIMA HEAVY IND CO LTD) 15 March 1980

D2: WO 02/06637 A (ALLIEDSIGNAL TURBO SA ;DECHANET ERIC (FR); FIGURA GIORGIO (FR); JE) 24 January 2002

2.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

A turbocharger (see figure) having a centre housing (9) and a thin-walled exhaust housing (2), both housings being connected to each other at cylindrical end portions (see figure) thereof by use of a floating flange ring (8) having a clamping surface which exerts at least an axial force component, wherein the turbocharger further comprises at least a counter part (the shoulders of the bolt 6) to the floating flange ring (8) having a clamping surface on the side of the end portion which forms a flange portion, opposite to the clamping surface of the floating flange ring (16), wherein said axial force component is exerted upon applying an axial load to said clamping surface by means of said counter part (by tightening the nut 7).

The subject-matter of claim 1 differs from this known turbocharger in that the end portion of the thin-walled housing is sandwiched between the floating ring and the flange portion of the centre housing.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as how to improve the joint between a thin-walled housing and the centre housing of a turbocharger.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The turbine housing-to-centre housing joint of the present application, by virtue of the sandwiching of the turbine housing between the centre housing and the

floating ring, allows the joint to be located outside the volute, contrary to the turbocharger disclosed in document D1. This means that no holes need be bored into the volute to accommodate axial fasteners. As a result, there is no risk of loosening of the fastener due to pressure fluctuations within the volute. A further advantage of the present application is that the sealing properties of the joint are improved due to the increased stiffness of the floating flange ring compared to the washers of D1, which ensures that the axial clamping load is evenly distributed over the whole circumference of the joint. Document D2 discloses the use of a V-band attachment to secure a thin-walled turbine housing to a centre housing. In the context of the present application, D2 would not be considered by the skilled person, as it does not teach a device as providing axial clamping force by means of a applying an axial load and the sandwiching arrangement of the joint is different. The skilled person is therefore not provided with teachings or hints which would prompt him to modify a turbocharger according to D1 in order to arrive at a turbocharger having the features of present claim 1.

- 2.2 Based upon the interpretation of claim 18 whereby it relates to a method of assembling a turbocharger according to any of claims 1-17, the same reasoning applies, *mutatis mutandis*. The subject-matter of such a clarified claim 18 therefore also meets the requirements of the PCT with respect to novelty and inventive step.
- 2.3 Claims 2-17 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
3. Claims 1-18 are deemed to be industrially applicable (Article 33(4) PCT).